Dr. Z.'s Number Theory Homework assignment 11

1. Using the first way, find the unique x between 0 and 34 such that

a.

$$x \equiv 4 \pmod 5 \quad , \quad x \equiv 2 \pmod 7 \quad .$$

b.

$$x \equiv 1 \pmod 5 \quad , \quad x \equiv 6 \pmod 7 \quad .$$

c.

$$x \equiv 2 \pmod 5 \quad , \quad x \equiv 5 \pmod 7 \quad .$$

2. Using the second way (the formula) find the unique x between 0 and 34 such that

a.

$$x \equiv 4 \pmod 5 \quad , \quad x \equiv 2 \pmod 7 \quad .$$

b.

$$x \equiv 1 \pmod 5 \quad , \quad x \equiv 6 \pmod 7 \quad .$$

c.

$$x \equiv 2 \pmod 5 \quad , \quad x \equiv 5 \pmod 7 \quad .$$

3. Using the make-a-table way, find the unique x between 0 and 59 such that

a.

$$x \equiv 3 \pmod 4 \quad , \quad x \equiv 2 \pmod 3 \quad , \quad x \equiv 3 \pmod 5 \quad .$$

b.

$$x \equiv 2 \pmod 4 \quad , \quad x \equiv 1 \pmod 3 \quad , \quad x \equiv 4 \pmod 5 \quad .$$

c.

$$x \equiv 3 \pmod 4 \quad , \quad x \equiv 0 \pmod 3 \quad , \quad x \equiv 1 \pmod 5 \quad .$$

4. Using the formula, find the unique x between 0 and 2001 such that

$$x \equiv 1 \pmod 2 \quad , \quad x \equiv 5 \pmod 7 \quad , \quad x \equiv 6 \pmod{11} \quad , \quad x \equiv 4 \pmod{13} \quad .$$

5. Use any method to find the smallest non-negative integer x such that

$$x \equiv 3 \pmod{1024} \quad , \quad x \equiv 3 \pmod{121} \quad , \quad x \equiv 3 \pmod{169} \quad , \quad x \equiv 3 \pmod{17} \quad , \quad x \equiv 3 \pmod{529} \quad .$$